Contents

Chapter 1—Metabolism

Alterations in Fluid Distribution During Sepsis Are Related to Abnormal Cellular Energetics 1
Thomas B. Morrissey, MD, Christopher Gatzen, FRCSE, Jan D. Rounds, BS, Jonathan Rose, BA, Takashi Kobayashi, MD, Vickye D. Robinson, AS, Douglas W. Wilmore, MD, FACS, and Danny O. Jacobs, MD, MPH

Glutathione-Mediated Blockade of Essential Fatty Acid-Induced Desensitization of Pancreatic Beta Cells to Glucose 3
Emmanuel C. Opara, PhD, Steve K. Lee, BS, and Onye E. Akwari, MD, FRCSC, FACS

Dose- and Time-Dependent Effects of Dietary Omega-3 Polyunsaturated Fatty Acids on Immune Functions in Mice 6
S. R. Chavali, PhD, H. Matsuura, MD, P. A. Burke, MD, and R. A. Forse, MD, PhD

Immunomodulation of Cultured Human Monocytes by Omega-3 Fatty Acid 9
Thomas T. Sato, MD, Iris A. Garcia, and Ronald V. Maier, MD, FACS

Depression of Hepatocyte Energy Status During Systemic Infection: An In Vivo ^{31}P Magnetic Resonance Spectroscopy Study 11
Takashi Kobayashi, MD, Malcolm K. Robinson, MD, Jan D. Rounds, BS, Vickye D. Robinson, AS, Eve De Rosa, BS, Douglas W. Wilmore, MD, FACS, and Danny O. Jacobs, MD, MPH

Hepatocyte Glutamine Transport in Advanced Malignant Disease 13
Paul S. Dudrick, MD, Edward M. Copeland, MD, FACS, and Wiley W. Souba, MD, ScD, FACS

Tumor Necrosis Factor Mediates Hepatic Steatosis During Total Parenteral Nutrition 15
Itzhak Pappo, MD, Elliot Berry, MD, Herve Bercovier, DVM, and Herbert R. Freund, MD

Enhancement of Macrophage Antigen Presentation by n-3 Polyunsaturated Fatty Acids 17
Paul E. Bankey, MD, R. Singh, MS, and Frank Cerra, MD, FACS

Lymphocyte Membrane Anisotropy Is Affected by Dietary Lipids and Is Correlated With the Lymphocyte Blastogenic Response to LPS 19
Michael D. Peck, MD, DSc, Zhiming Li, MD, MSc, and Berton C. Pressman, PhD

A Rapid Effect of Endotoxin on the Myocardium 22
Charles B. Cairns, MD, Denis D. Bensard, MD, Chris B. Winter, MD, Alden H. Harken, MD, FACS, and Anirban Banerjee, PhD

Stimulation of the Autonomic Nervous System (ANS) Mediates Short-Chain Fatty Acid (SCFA) Induced Jejunal Trophism 24
Wendy Frankel, MD, Wei Zhang, MD, Anudeep Singh, BA, David Klurfeld, PhD, Takashi Sakata, MD, Irvin Modlin, MD, and John Rombeau, MD, FACS

Effect of Glutamine on Protein Synthesis in Isolated Enterocytes from Septic Rats 26
Takashi Higashiguchi, MD, Janice A. Frederick, MD, Oded Zamir, MD, Per-Olof Hasselgren, MD, FACS, and Josef E. Fischer, MD, FACS

Chapter II—Shock

Hemorrhagic Shock Inhibits Granulocyte–Macrophage Colony Formation (CFU-GM) but Does Not Alter Bone Marrow Prostaglandin Production 29
David H. Livingston, MD, FACS, Ming Tao Wang, MD, and Thomas W. Lysz, PhD

The Effects of Hypertonic Perfusion on Intracellular Sodium, Calcium, and Hydrogen Ion Concentrations During Hypoxia 32
Hung S. Ho, MD, Steven E. Anderson, PhD, James W. Holcroft, MD, FACS, and Peter M. Cala, PhD

Incidence of Arterial Hypoxemia After Laparotomy 35
Jacob Rosenberg, MD, Mikael Hjorth Pedersen, MD, Thomas Ullstad, MD, Franz von Jessen, MD, Niels Jespersen, MD, Ole Vinge, MD, Jes Rasmussen, MD, Flemming Pii Hjørne, MD, Niels Jørgen Poulsen, MD, and Henrik Kehlet, MD, PhD

Regional Hemodynamic and Metabolic Effects of Chronic Hyperdynamic Sepsis in Unrestrained Rats 38
Ziv Gamliel, MD, Alexander D. Romaschin, PhD, Shinta Liauw, MSc, John C. Marshall, MD, FRCSC, and Paul M. Walker, MD, PhD, FRCSC

"Protective" Effects of Early Traumatic Immunosuppression 40
H. Paul Redmond, MCh, FRCSI, Jian Shou, MD, and John M. Daly, MD, FACS

Disseminated Intravascular Coagulation but Not Fibrinolysis Follows Intestinal Ischemia 42
James Hill, MD, Thomas F. Lindsay, MD, Ruth Simpson, MD, C. Robert Valeri, MD, David Shepro, PhD, and Herbert B. Hechtman, MD, FRCS

Analysis of Regional Hemodynamic Regulation in Response to Scald Injury..... 44
Paul A. Taheri, MD, Seth D. Force, BA, Howard L. Lippton, MD, Albert A. Hyman, MD, Lewis M. Flint, MD, FACS, and John J. Ferrara, MD, FACS

The Effect of the Germ-Free State on Survival Following Hemorrhagic Shock. A Study in Germ-Free and Germ-Bearing Rats..... 47
Christopher J. Bruce, MD, Benjamin F. Rush, Jr, MD, FACS, Frank J. Ferraro, MD, Thomas F. Murphy, MS, John T. Hsieh, BS, and George W. Machiedo, MD, FACS

Hypertonic Resuscitation of Shock and Head Injury: Short- and Long-Term Effects on Fluid Balance, Intracranial Pressure, Brain Water Content, and Cerebral Blood Volume and Flow..... 49
John T. Anderson, MD, David H. Wisner, MD, FACS, Michael J. Matteucci, BA, Patrick E. Sullivan, MD, and Steve P. Freshman, MD

Plasma Protein Shifts in Acute Isovolemic Hemodilution 51
Paul D. Faringer, MD, Carolyn S. Fairfax, MD, Joyce Feliciano, BAS, and Richard J. Mullins, MD, FACS

Histamine-2 Blocker Infusion Decreases Portal Venous Flow and Hepatic Blood Flow in Anesthetized Canines 53
Peter N. Purcell, MD, Richard D. Branson, RRT, Ken Davis, Jr, MD, FACS, and Daniel J. Johnson, MD, FACS

Endotoxin Preconditioning Preempts Gut Ischemia/Reperfusion-Induced Neutrophil (PMN)-Mediated Lung Injury..... 56
Kaoru Koike, MD, Frederick A. Moore, MD, FACS, Ernest E. Moore, MD, FACS, Verlyn M. Peterson, MD, Virginia S. Carl, MS, and Anirban Banerjee, PhD

Chapter III—Sepsis

The Safe Administration of Effective Concentrations of Inhaled Nitric Oxide in Piglets 59
Timothy D. Jacob, MD, Don K. Nakayama, MD, FACS, Ippei Seki, MD, Renee Extler, RRT, Richard L. Simmons, MD, FACS, Andrew B. Peitzman, MD, FACS, Timothy R. Billiar, MD, Samuel Yousem, MD, and Etsuro K. Motoyama, MD

Alveolar Macrophages Stimulate Surfactant Secretion by the Lung ... 62
Jason P. Winfield, MD, Stanley Z. Trooskin, MD, FACS, Andrew W. Mikulaschek, MD, Allen Norin, PhD, and Stephan Kamholz, MD

Alveolar Macrophage-Mediated Immune Suppression Following Portal Endotoxemia: The Role of Transforming Growth Factor-Beta (TGF-β) 64
Peter T. Chu, MD, Melanie B. Ribeiro, BSc, Ori D. Rotstein, MD, MSc, FRCSC, FACS, and John C. Marshall, MD, FRCSC, FACS

Alveolar Macrophages Exposed to Hyperoxia Demonstrate Early Enhanced Cytokine Productive Capacity 66
Hugh J. Lindsey, MD, John M. Kisala, MD, FACS, Alfred Ayala, PhD, and Irshad H. Chaudry, PhD

Macrophage-Mediated Alterations in Lung Epithelial Cell Permeability During Sepsis 68
Christopher G. Compeau, MD, Hugh O'Brodovich, MD, FRCP, Arthur Slutsky, MD, Bijan Rafii, BSc, and Ori D. Rotstein, MD, FRCSC, FACS

Evaluation of an Infection-Resistant Silver-Chlorhexidine-Impregnated PTFE Soft Tissue Patch 70
Leon Dent, MD, Shanta Modak, PhD, Lester Sampath, BA, Soji F. Oluwole, MD, FACS, and Mark A. Hardy, MD, FACS

Macrophage Elimination Increases Bacterial Translocation and Gut-Origin Septicemia but Decreases Symptoms and Mortality in a Model of Systemic Inflammation 72
Grard A. P. Nieuwenhuijzen, MD, Yuval Haskel, MD, Qi Lu, MD, Rodney D. Berg, PhD, Nico van Rooijen, PhD, R. Jan A. Goris, MD, and Edwin A. Deitch, MD

Pentoxifylline Modulates the Immune Abnormalities Associated with Thermal Injury and Improves Survival Following Septic Challenge ... 74
Rene G. Holzheimer, MD, Richard G. Molloy, FRCSI, Diarmuid S. O'Riordain, MB, FRCSI, Manuel V. Mendez, MD, Kathryn Collins, BS, Miriam Nestor, BS, Inna Saporoschetz, BS, Paul Curley, FRCS, John A. Mannick, MD, FACS, and Mary L. Rodrick, PhD

Contribution of Interleukin-1 and Interleukin-6 Toward the Host Response to Inflammation 77
Hester S. A. Oldenburg, MD, Kimberly J. Van Zee, MD, Douglas D. Lazarus, PhD, William A. Thompson, MD, Michael A. Rogy, MD, Richard Chizzonite, PhD, Lyle L. Moldawer, PhD, and Stephen F. Lowry, MD, FACS

Radio-Detoxified Endotoxin Reduces Death From Intraperitoneal Sepsis 80
Robert J. Schwartz, MD, Mark P. Mueller, MD, Terry J. Dubrow, MD, Russell A. Williams, MD, and Samuel E. Wilson, MD

Does Immediate Administration of Parenteral Antibiotic or Peritoneal Irrigation with Extremely Dilute Antibiotic Solution Affect Survival in Fecal Peritonitis? 82
Philip W. Perdue, MD, Kirk K. Kazarian, MD, FACS, and Taffy Williams, PhD

Platelet-Activating Factor Antagonist (Ro24-4736) Attenuates the Metabolic Response to Gram-Negative Sepsis in Primates 84
William A. Thompson, MD, Kimberly J. Van Zee, MD, Ashwini Kumar, Hester S. A. Oldenburg, MD, Michael Rogy, MD, Diane Felsen, PhD, Stephen F. Lowry, MD, FACS, and Lyle L. Moldawer, PhD

Chapter IV—Cytokines

Mechanisms Responsible for the Increase of Interleukin-6 Synthesis .. 88
Wolfgang Ertel, MD, Mary H. Morrison, MS, Alfred Ayala, PhD, and Irshad H. Chaudry, PhD

In Vitro LPS Pretreatment Differentially Regulates TNF, PGE_2, and IL-1 Release by Macrophages 90
Michael A. West, MD, PhD, Robin Manthei, and Melvin P. Bubrick, MD, FACS

Cytokines Acutely Decrease Circulating Insulin-Like Growth Factor-1 (IGF-1) and IGF Binding Protein-3 (IGFBP-3) 92
Douglas D. Lazarus, PhD, Stephen F. Lowry, MD, FACS, and Lyle L. Moldawer, PhD

Endothelial Regulation of Macrophage Tumor Necrosis Factor Production 94
John G. Williams, MD, Iris A. Garcia, BS, and Ronald V. Maier, MD, FACS

Monoclonal Antibody to Tumor Necrosis Factor Reduces Lung Sequestration of Neutrophils and Attenuates Acute Lung Injury in Sepsis 97
Alastair C. J. Windsor, FRCS, Patrick G. Mullen, FRCSI, Ciaran J. Walsh, FRCSI, Bora Duruman, BS, Alpha A. Fowler, MD, and Harvey J. Sugerman, MD, FACS

Cytokine Downregulation and Protection From Tumor Necrosis Factor by a Prostaglandin Analogue 99
Helen W. Pogrebniak, MD, Thomas W. Prewitt, MD, Wilbert Matthews, BS, and Harvey I. Pass, MD, FACS

Interferon Regulatory Factor Gene Expression Is Induced in Hepatocytes in Models of Sepsis 102
David A. Geller, MD, Stewart C. Wang, MD, Mauricio Di Silvio, MD, Andreas K. Nussler, PhD, Gail Bloomgarden, MD, David J. Tweardy, MD, Timothy R. Billiar, MD, and Richard L. Simmons, MD, FACS

Interferon-Gamma Partially Reverses Glucocorticoid-Induced Depression of Hepatocyte Nitric Oxide (·N=0) Production in a Coculture Model 104
Paul H. Kispert, MD, Timothy R. Billiar, MD, Ronald D. Curran, MD, David S. Medich, MD, and Richard L. Simmons, MD, FACS

Effect of Interferon-γ Administration After Injury on Experimental Pneumonia 107
Cathal J. Kelly, MB, FRCSI, H. Paul Redmond, MCh, FRCSI, Jian Shou, MD, Hubert Gallagher, MB, FRCSI, and John M. Daly, MD, FACS

Interleukin-2 Receptor Expression in a Murine Model of Thermal Injury 110
Diarmuid S. O'Riordain, MB, FRCSI, Manuel V. Mendez, MD, Rene G. Holzheimer, MD, Kathryn Collins, BS, Mary L. Rodrick, PhD, and John A. Mannick, MD, FACS

Immune Complex-Mediated Modulation of CD14 Is Associated with Prostaglandin E_2 and Tumor Necrosis Factor-α Production.....112
Christof Birkenmaier, MD, and Jan K. Horn, MD, FACS

The Central Role of Phospholipase A_2 (PLA_2) in Inflammatory Mediator Release in Cellular Injury 115
Jimmie N. Collins, MD, Ernest D. Graves III, MD, Gesina Longenecker, PhD, and J. Raymond Fletcher, MD, PhD, FACS

Chapter V—Alimentary Tract

A Possible Involvement of Epidermal Growth Factor in Pancreatic Regeneration After Partial Pancreatectomy in Adult Rats 117
Shun-ichi Higashide, MD, Kazutomo Inoue, MD, Hideshi Minote, MD, Masafumi Kogire, MD, Chisato Mori, MD, Kohei Shiota, MD, and Takayoshi Tobe, MD, FACS

Dual Pathways Regulate Neurite Outgrowth in Enteric Neurons.....119
Diane M. Simeone, MD, and Michael W. Mulholland, MD, PhD

Effect of Gastrin on Growth and Signal Transduction in Human Colon Cancer Cells.....121
Jin Ishizuka, MD, Courtney M. Townsend, Jr, MD, FACS, and James C. Thompson, MD, FACS

Seventy Percent Hepatectomy: Comparative Effects of Parenteral and Enteral Nutrition on Liver Regeneration, Morbidity, and Mortality ..124
Joseph John, MD, Harry M. Delany, MD, FACS, Stanley M. Levenson, MD, FACS, Eutiquio L. Teh, BSChE, J. J. Steinberg, MD, Chang-Sheng Li, MD, and Marvin L. Gliedman, MD, FACS

Hepatic Glucose Production and Insulin Influence During Liver Regeneration 126
David A. Krusch, MD, Sandra B. Schultz, MD, Seymour I. Schwartz, MD, and Mary Jo Witt, BA

Tumor Necrosis Factor-Alpha Infusion Produces Vasoconstriction in the Gastric Microcirculation 129
Michael P. Darnell, MD, John G. Wood, PhD, and Laurence Y. Cheung, MD, FACS

Leukotriene-Induced Exacerbation of Gastric Mucosal Injury From Bile Acid Is Negated by Calcium Channel Blockade 131
David W. Mercer, MD, Theodore R. Sullivan, MD, Richard E. Milner, BS, Wallace P. Ritchie, Jr, MD, PhD, FACS, and Daniel T. Dempsey, MD, FACS

The Role of Transforming Growth Factor-β1 During Biliary Fibrosis and Intrahepatic Bile Duct Hyperplasia in the Rat 133
Lawrence A. Saperstein, BS, Randy L. Jirtle, PhD, Marwan Farouk, MD, FRCS, Hugh J. Thomson, MD, FRCS, Kyung S. Chung, MD, and William C. Meyers, MD, FACS

Mechanism of Action of Transforming Growth Factor-Beta on Rat Jejunal Cells 135
Tien C. Ko, MD, R. Daniel Beauchamp, MD, Jin Ishizuka, MD, Courtney M. Townsend, Jr, MD, FACS, and James C. Thompson, MD, FACS

Nitric Oxide Is a Mediator of Gastrin-Stimulated Gastric Mucosal Hyperemia 137
Justin T. Gerstle, MD, John Washington, Robert L. Conter, MD, FACS, and Gordon L. Kauffman, MD, FACS

Hepatocyte Release of Nitric Oxide Into the Bile Under Inflammatory Conditions.....139
Mauricio Di Silvio, MD, David A. Geller, MD, Andreas K. Nussler, PhD, Vincent H. Chough, BS, Debra L. Williams, BS, Richard L. Simmons, MD, FACS, and Timothy R. Billiar, MD

The Role of Nitric Oxide as a Mediator of the Mucosal Hyperemic Response in the Rat Stomach.....141
Robert S. Podolsky, MD, Richard E. Milner, BS, Wallace P. Ritchie, Jr, MD, PhD, FACS, and Daniel T. Dempsey, MD, FACS

Visceral Afferent Nerves Mediate Protection Against Acid-Bile Injury of the Esophagus.....143
Bert M. Petersen, Jr, MD, Lisa D. Curcio, MD, Karim S. Trad, MD, John W. Harmon, MD, FACS, and Barbara L. Bass, MD, FACS

Mechanisms of Cl^- Transport Across the Nutrient Cell Membranes of *Necturus* Gastric Surface Epithelium.....145
David I. Soybel, MD, and Laurence Y. Cheung, MD, FACS

Role of Na^+-Glucose Cotransport in Meal-Induced Jejunal Absorption.....147
Mark L. Welton, MD, Stanley W. Ashley, MD, Erik S. Barquist, MD, Jerry C. Miller, BS, and Michael J. Zinner, MD, FACS

Endotoxin-Mediated Regulation of Gut Ornithine Decarboxylase Enzyme Activity.....149
Dai H. Chung, MD, B. Mark Evers, MD, Courtney M. Townsend, Jr, MD, FACS, David N. Herndon, MD, FACS, and James C. Thompson, MD, FACS

Growth Hormone, Glutamine, and Fiber Enhance Adaptation of Remnant Bowel Following Massive Intestinal Resection 151
Theresa A. Byrne, MS, RD, Thomas B. Morrissey, MD, Thomas R. Ziegler, MD, Christopher Gatzen, FRCSE, Lorraine S. Young, MS, RD, and Douglas W. Wilmore, MD, FACS

Transgenic Mouse Models for Studying Regulation of Gut Epithelial Proliferation and Differentiation 153
Steve H. Kim, MD, Kevin A. Roth, MD, PhD, and Jeffrey I. Gordon, MD

Effect of Propranolol on Human Myoelectric Activity.....155
Mark A. Carlson, MD, Kirk A. Ludwig, MD, Verne E. Cowles, PhD, Constantine T. Frantzides, MD, PhD, and Robert E. Condon, MD, MS, FACS

Neural Pathways of the Ileal Brake: Effect of Proximal Gastric Vagotomy 157
Frederic-Simon Hould, MD, Richard Heddle, MD, and Keith A. Kelly, MD

Endothelin-Induced Gastric Vasoconstriction Is Enhanced After Ischemia/Reperfusion: Effect of Superoxide Dismutase 160
Zhong Yu Yan, MD, John G. Wood, PhD, Michael P. Darnell, MD, and Laurence Y. Cheung, MD, FACS

Importance of Bacterial and Endotoxin Translocation via Mesenteric Lymph Following Ischemia 163
Ruth Simpson, MD, James Hill, MD, Thomas F. Lindsay, MD, Michael Delaney, MD, C. Robert Valeri, MD, David Shepro, PhD, and Herbert B. Hechtman, MD, FRCS

Distribution of Capillary Blood Flow in the Bowel Wall in Response to Local Mesenteric Hypoperfusion 165
Steven J. McClane, MD, Wilson Ko, MD, Thomas A. Godwin, MD, and Jerome J. DeCosse, MD, FACS

Regulation of Lipopolysaccharide Binding Protein Gene Transcription in Rat Hepatocytes 169
Stewart C. Wang, MD, David A. Geller, MD, Grace L. Su, MD, Yong-Hong Wan, MD, Richard A. Shapiro, BS, David J. Tweardy, MD, Timothy R. Billiar, MD, Paul H. Kispert, MD, FACS, and Richard L. Simmons, MD, FACS

Glutamine Enhances Hepatocellular Energetics During Sepsis.....171
Malcolm K. Robinson, MD, Takashi Kobayashi, MD, Jan D. Rounds, BS, Vickye D. Robinson, AS, Eve De Rosa, BS, Douglas W. Wilmore, MD, FACS, and Danny O. Jacobs, MD, MPH

Development of a Hybrid Xenogeneic Bioartificial Liver 174
Jacek Rozga, MD, PhD, Michael D. Holzman, MD, Donald W. Griffin, MD, Man-Soo Ro, MD, PhD, Daniel F. Neuzil, MD, Albert D. Moscioni, PhD, and Achilles A. Demetriou, MD, PhD, FACS

Liver Atrophy Induced by Selective Bile Duct Obstruction Is Independent of Portal Blood Flow.....177
Nicholas S. Hadjis, MD, FRCS, and Roger G. Keith, MD, FRCSC, FACS

Cholesterol Feeding Promotes Hepatic Secretion of 28–55-kDa Glycoproteins.....178
Howard S. Kaufman, MD, Pamela A. Lipsett, MD, M. Karen Fox-Talbot, BA, Michele A. Shermak, MD, Keith D. Lillemoe, MD, FACS, and Henry A. Pitt, MD, FACS

Somatostatin Promotes Gallbladder Absorption: A Potential Cause of Gallstones 180
A. James Moser, MD, Mohammad Z. Abedin, PhD, and Joel J. Roslyn, MD, FACS

Decreased Primary Bile Acid Output During Total Parenteral Nutrition.....182
Lillian G. Dawes, MD, FACS, MaryAnne Greiner, MS, Robert V. Rege, MD, FACS, and David L. Nahrwold, MD, FACS

A Novel Cholesterol Carrier Helps Prevent Crystal Precipitation.....184
Steven A. Ahrendt, MD, M. Karen Fox-Talbot, BA, Howard S. Kaufman, MD, Keith D. Lillemoe, MD, FACS, and Henry A. Pitt, MD, FACS

Intraislet Somatostatin Regulates Pancreatic Polypeptide Secretion in the Isolated Perfused Rat Pancreas 186
Robert Kleinman, MD, Ronald Gingerich, PhD, Helen Wong, MS, Gordon Ohning, MD, PhD, Edward Passaro, MD, Seymour Levin, MD, Michael J. Zinner, MD, and F. Charles Brunicardi, MD

Cholecystokinin-Stimulated Pancreatic Polypeptide Release Is Mediated by Extrapancreatic, Cholinergic Nerves 188
Boris W. Kuvshinoff, MD, Robert J. Brodish, MD, Aaron S. Fink, MD, FACS, and David W. McFadden, MD, FACS

Evidence Supporting a Role for the Hydroxyl Radical as a Mediator of Acute Pancreatitis in the Rat 190
Dexter G. Turnquest, MD, Gregory S. Smith, MS, Diane H. Russell, PhD, Thomas A. Miller, MD, FACS, and Frank G. Moody, MD, FACS

Stimulation of Pancreatic Amylase Release by Gastrin Releasing Peptide and Neuromedin C via Direct and Neurally Mediated Mechanisms ..192
Kenneth M. Flowe, MD, Theodore H. Welling, BS, and Michael W. Mulholland, MD, PhD

Chapter VI—Cardiothoracic Surgery

The Role of Aspartate and Glutamate in Myocardial Metabolism During Clinical Cardiac Surgery 195
Si M. Pham, MD, Emily Morris, BS, Patricia Sawzik, PhD, Michael Klein, MD, Pedro J. del Nido, MD, and Brack G. Hattler, MD, PhD

Prevention of Cytosolic Calcium Accumulation by Magnesium Cardioplegia in Surgically Induced Ischemia 197
Keiji Ataka, MD, David P. Chen, SB, Harold Feinberg, PhD, James D. McCully, PhD, and Sidney Levitsky, MD, FACS

Effects of Adenosine on Flow, Function, and Interstitial Nucleoside Levels in Normal and Stunned Myocardium..... 200
Mohinder P. S. Randhawa, Jr, MD, Robert D. Lasley, PhD, Gregory Anderson, BS, Julia Hegge, BS, and Robert M. Mentzer, Jr, MD, FACS

The Superiority of Normothermic Blood Cardioplegia Is Reflected in the Absence of Postischemic Functional Deterioration of Sarcoplasmic Reticulum 203
Xuekun Liu, MD, Richard M. Engelman, MD, FACS, Zongjie Wei, MD, Nilanjana Maulik, PhD, John A. Rousou, MD, FACS, Joseph E. Flack III, MD, David W. Deaton, MD, and Dipak K. Das, PhD

Myocardial Distribution of Retrograde Warm Blood Cardioplegia....205
Christopher A. Caldarone, MD, Irvin B. Krukenkamp, MD, Bruce D. Misare, MD, and Sidney Levitsky, MD, FACS

Can Continuous Warm Blood Cardioplegia Be Safely Interrupted?...208
Bruce D. Misare, MD, Irvin B. Krukenkamp, MD, Christopher A. Caldarone, MD, and Sidney Levitsky, MD, FACS

The Intermittent Delivery of Warm Blood Cardioplegia.....210
Andrew Y. Chan, MSc, Alexander Aronov, MD, PhD,
Aaron P. Hong, MSc, Samuel V. Lichtenstein, MD, PhD, FRCSC,
and James G. Abel, MD, MSc, FRCSC

Discrepancy Between Capillary Perfusion and Myocardial Cooling
During Retrograde Cardioplegia: Comparison With Antegrade
Cardioplegia.....213
Flordeliza S. Villaneuva, MD, William P. Glasheen, PhD,
John M. Dent, MD, Sanjiv Kaul, MD, FACC,
and William D. Spotnitz, MD, FACC, FACS

Myocellular Gene Expression in Response to Ischemic Reperfusion
Injury During Cardiopulmonary Bypass 215
William E. Curtis, MD, Luke O. Schoeniger, MD, PhD,
Stephen C. Beck, BS, Timothy G. Buchman, MD, PhD, FACS,
and Timothy J. Gardner, MD, FACS

Preservation of Coronary Endothelial Function Results in Improved
Cardiac Function Following Prolonged Ischemic Cardiac Arrest 218
John A. Kern, MD, David C. Cassada, BA, Barry B. K. Chan, MD,
Michael Towler, MD, Donald B. Schmit, MD,
Irving L. Kron, MD, FACS, and Curtis G. Tribble, MD, FACS

After Reversible Myocardial Injury, Recovery of Creatine Kinase
Activity During Reperfusion Normalizes High Energy Phosphate
Metabolism and Ventricular Function 221
Lewis J. Kaplan, MD, Haywood Blum, MD, PhD,
Mary Osbakken, MD, PhD, Tamas Ivanics, MD,
Anirban Banerjee, PhD, and Glenn J. R. Whitman, MD

Cytokine Production Associated With Myocardial Ischemia Following
Uncomplicated Coronary Artery Bypass Grafting 223
Hani A. Hennein, MD, Jorge L. Rodriguez, MD, Hailu Ebba, MD,
Scot H. Merrick, MD, Fraser M. Keith, MD,
Daniel G. Remick, MD, Lazar J. Greenfield, MD,
and J. Scott Rankin, MD

Cardiac Assist With Skeletal Muscle Ventricles: Apex to Aorta Configuration.....226
Huiping Lu, MD, Robert L. Hammond, BA, Robert Fietsam, Jr, MD, Hidehiro Nakajima, MD, Frank W. Mocek, MD, Gregory A. Thomas, MD, Hisako Nakajima, MD, and Larry W. Stephenson, MD, FACS

Cardiomyoplasty: Unstimulated Latissimus Dorsi Muscle Wrap Reduces Cardiac Output 228
Wang Cheng, MD, PhD, Bobby S. David, MD, Rafael A. Avila, MD, Ira Nathan, PhD, Corrado P. Marini, MD, Joseph N. Cunningham, Jr, MD, FACS, and Israel J. Jacobowitz, MD, FACS

Skeletal Muscle Diastolic Counterpulsation: Effect of R-Wave Delay and Pulse Duration of Left Ventricular Relaxation Mechanics.....231
Frank W. Mocek, MD, Huiping Lu, MD, Robert L. Hammond, BA, Gregory Thomas, MD, Hidehiro Nakajima, MD, Robert Fietsam, Jr, MD, Hisako Nakajima, MD, and Larry W. Stephenson, MD, FACS

Effect of Left Heart Assist on Right Ventricular Muscle Mechanics and Ventricular Interaction in the Injured Heart.....234
Kunio Fujita, MD, Gerald E. McGrath, James W. Davis, MSEE, and James J. Morris, MD

Left Ventricular Mechanics During Pulsatile Left Atrial to Aortic Bypass 236
Osamu Kawaguchi, MD, Walter E. Pae, Jr, MD, FACS, David N. Katz, BS, and William S. Pierce, MD, FACS

Myocardial Oxygen Delivery and Consumption During Mechanical Circulatory Support.....238
Reed D. Quinn, MD, Walter E. Pae, Jr, MD, FACS, and William S. Pierce, MD, FACS

A Working Heterotopic Heart Transplantation Model 241
Mai Ding, MD, Cornelious M. Dykes, MD, Margit Kadletz, MD, Anwar S. Abd-Elfattah, PhD, and Andrew S. Wechsler, MD, FACS

Cardiac Storage With UW Solution and Glucose.....244
Stephen E. Fremes, MD, FRCS, Robert D. Furukawa, BSc, Lin-Rui Guo, MD, Donald A. G. Mickle, MD, and Richard D. Weisel, MD, FACS

Multidose Cardioplegia as a Strategy for Twenty-Four-Hour Functional and Metabolic Preservation of the Cardiac Explant.....246
Michael C. Banker, MD, Melinda Claydon, BS, George L. Hicks, Jr, MD, FACS, and Tingchung Wang, PhD

Desensitization of Myocardial β-Adrenergic Receptors After Brain Death.....249
Thomas A. D'Amico, MD, Debra A. Schwinn, MD, Cary H. Meyers, MD, David C. Sabiston, Jr, MD, FACS, and Peter Van Trigt, MD, FACS

Toward the Development of a Thymic Scan: Nature of Binding Characteristics of Monoclonal Antibodies to Rat and Human Thymic Epithelium and Perithymic Tissue 252
L. Carr McClain, MD, Reid Adams, MD, James K. Roche, MD, PhD, and Thomas M. Daniel, MD, FACS

Potential Distribution Mapping in Human Ventricular Tachycardia: Precise Localization With a New Intraoperative Technique.....255
Chris K. Rokkas, MD, Richard B. Schuessler, PhD, Barry H. Branham, MS, Takashi Nitta, MD, James S. Tweddell, MD, John P. Boineau, MD, and James L. Cox, MD, FACS

Depletion of the Ventricular Mitochondrial Oxygen Store: The Etiology of Tachycardia-Induced Cardiomyopathy? 257
Francis G. Duhaylongsod, MD, Mark P. Anstadt, MD, Mark Tedder, MD, Fred Crawford, Jr, BA, James E. Lowe, MD, FACS, and Walter G. Wolfe, MD, FACS

Electrophysiological Consequences of Myocardial Protection During Surgical Ischemia 260
Neri M. Cohen, MD, PhD, Todd E. Nixon, MD, and Ralph J. Damiano, Jr, MD

Technical Modification of the Maze Procedure for Atrial Fibrillation 264
Robert D. B. Jaquiss, MD, C. S. Cronin, MD, Takashi Nitta, MD, M. Mitsuno, MD, Richard B. Schuessler, PhD, John P. Boineau, MD, and James L. Cox, MD, FACS

Perioperative Transesophageal Doppler Echocardiographic Verification of Atrial Transport Function Following the Maze Procedure for Atrial Fibrillation 267
Dwight E. Hand, MD, PhD, Demetrios G. Lappas, MD, Charles W. Hogue, Jr, MD, and James L. Cox, MD, FACS

Limitations of Sequential Vein Grafts Compared to Single Grafts 269
Richard S. Zeri, MD, Robert M. Lust, PhD, You Su Sun, MD, Masaki Otaki, MD, Steven B. Hopson, MD, and W. Randolph Chitwood, MD, FACS

Platelet Deposition of Saphenous Vein Coronary Artery Bypass Grafts at the Time of Reoperation: Comparison to Fresh Saphenous Vein 272
Kevin O. Garrett, MD, Karyn L. Connolly, BS, Brack G. Hattler, MD, PhD, and Peter C. Johnson, MD

Adenosine Triphosphate: A Potent and Selective Vasodilator for Pulmonary Hypertension After Cardiopulmonary Bypass 274
Peter W. Cho, MD, Matthew G. Blum, BS, Marc A. Gillinov, MD, Mark G. Clemens, PhD, and Duke E. Cameron, MD

Biventricular Adaptation to Pulmonary Hypertension in Humans: Estimation of Ventricular Wall Stress Using Finite Element Analysis 276
Stephan G. Wyers, MD, Lawrence L. Creswell, MD, William H. Perman, PhD, Michael W. Vannier, MD, Barna A. Szabo, PhD, and Michael K. Pasque, MD, FACS

Comparative Effects of Dopamine and Dobutamine on Pulmonary Vascular Impedance and Right Ventricular Power Requirements 280
Cemil M. Purut, MD, Damian M. Craig, BS, Hidetoshi Utsunomiya, MD, Scott H. Johnson, MD, and Peter K. Smith, MD, FACS

Regional Myocardial Wall Strain Using Magnetic Resonance Imaging: A New Method for Validation of Mathematical Models of the Heart 283
Lawrence L. Creswell, MD, Stephan G. Wyers, MD, William H. Perman, PhD, Michael W. Vannier, MD, Barna A. Szabo, PhD, and Michael K. Pasque, MD, FACS

Presence of Human Endothelial Cells on Great Arteries and Valve Leaflets: A Comparison of Untreated Tissues and Cryopreserved Allografts 287
Flavian M. Lupinetti, MD, FACS, Thomas T. Tsai, James M. Kneebone, MS, and Edward L. Bove, MD, FACS

Defective Glucose Metabolism in Uremic Hearts: A Possible Mechanism for Contractile Dysfunction 290
Eric Munoz, MD, Timothy W. King, BS, O. H. Frazier, MD, FACS, and Heinrich Taegtmeyer, MD, PhD

Extended Lung Preservation With Cold-Air Storage and Modified Eurocollin's Flush 293
Michael H. Hines, MD, Neal D. Kon, MD, FACS, Beverly J. Spray, PhD, and Stephen A. Mills, MD, FACS

University of Wisconsin Solution Is Superior to Cold Blood Preservation for Lung Transplantation 295
Michael Bresticker, MD, Junichi Oba, MD, Joseph LoCicero III, MD, FACS, and Rodney Greene, BS

Tidal Volume and Respiratory Rate Changes During CO_2 Rebreathing Following Lung Transplantation 297
Gregory D. Trachiotis, MD, Simon R. Knight, MD, G. Alexander Patterson, MD, Joel D. Cooper, MD, FACS, and Elbert P. Trulock, MD

Heterotopic Lung Transplant: Temporary Support for Gas Exchange in ARDS 300
Brian L. Cmolik, MD, Steven E. Park, MD, Dennis R. Trumble, MS, Bernard E. Pennock, PhD, and James A. Magovern, MD

Lung Transplantation and Right Ventricular/Arterial Coupling in Pulmonary Hypertension 304
Shigeki Morita, MD, Akihiko Kawai, MD, William A. Mandarino, MSME, Thomas Gasior, MD, John M. Armitage, MD, Robert L. Hardesty, MD, Robert L. Kormos, MD, and Bartley P. Griffith, MD

Augmentation of Cardiac Output Versus Airway Pressure Manipulation During One Lung Ventilation: Effects on Pulmonary Oxygen Exchange 307
David J. Dries, MD, FACS, Pankaj Kumar, MD, Bradford Blakeman, MD, FACS, and Mali Mathru, MD

Regional and Systemic Immune Responses in a Model of Empyema 309
Wahid Naziri, MD

Single Lung Transplant in a Canine Model of Single Ventricle Physiology 312
Dale R. Levy, MD, Ali M. Sadeghi, MD, Craig Mezrow, MS, Alejandro Gandsas, MD, Howard Shiang, DVM, Anthony F. Rossi, MD, Robert J. Sommer, MD, and Randall B. Griepp, MD, FACS

Intermittent Perfusion During Hypothermic Circulatory Arrest: A New and Effective Technique for Cerebral Protection 314
James R. Mault, MD, Elizabeth G. Whitaker, BA, Jeffrey S. Heinle, MD, Andrew J. Lodge, BA, William J. Greeley, MD, and Ross M. Ungerleider, MD, FACS

Role of the L-Arginine–Nitric Oxide Pathway in Myocardial Dysfunction After Reoxygenation of Immature Heart on Cardiopulmonary Bypass 316
Georg Matheis, MD, Kiyozo Morita, MD, Gerald D. Buckberg, MD, Kai Ihnken, MD, Michael P. Sherman, MD, Helen H. Young, PhD, and Louis J. Ignarro, PhD

Twenty-Four-Hour Myocardial Preservation With Cardioplegia Buffering 319
Akihiko Ohkado, MD, Hung Cao-Danh, PhD, K. Eric Sommers, MD, and Pedro J. del Nido, MD, FACS

Chapter VII—Vascular Surgery

Effects of Wall Shear Stress and Graft Orientation on Vascular Healing of Tapered Grafts 322
Tarek A. Salam, MD, FRCS, Alan B. Lumsden, MD, William D. Suggs, MD, and David N. Ku, MD, PhD

Endothelial Cell Dysfunction on Synthetic Bypass Grafts Corrected by Extracellular Matrix Coatings 324
Khodam Rostami, BS, Tai Lan Tuan, PhD, Delia Ertl, MS, Marcel Nimni, PhD, James J. Reid, BS, Fred A. Weaver, MD, Albert E. Yellin, MD, David Wei, MS, and Anthony C. Sank, MD

Are G-Proteins Mechanotransducers for Endothelial Cells?.....327
C. Richard G. Cohen, MBBChir, FRCS, Ira Mills, PhD, and Bauer E. Sumpio, MD, PhD, FACS

Myofibroblast Proliferation In Vivo Is Modulated by Vascular Prosthetic Wall Elasticity.....329
Gregory C. Zenni, MD, Scott C. Henderson, Dae U. Kim, MD, and Howard P. Greisler, MD, FACS

Probucol Alters the Cellular Characteristics of Anastomotic Intimal Hyperplasia.....332
Dirk S. Baumann, MD, Manuel Doblas, MD, Alan Daugherty, PhD, Gregorio A. Sicard, MD, FACS, and Gustav Schonfeld, MD

Human M-CSF Production by Rabbit Vascular Endothelial and Smooth Muscle Cells 334
Tammy K. Ramos, MD, Stephen J. Lauer, PhD, Jerry Goldstone, MD, and John M. Taylor, PhD

Retroviral-Mediated Human tPA Gene Transfer in Canine Endothelial Cells: Comparative Effects of Protamine and Polybrene on Cellular Transduction and Gene Expression 337
Thomas A. Whitehill, MD, Rachel M. Podrazik, MD, Daryoush Ekhterae, PhD, Louis M. Messina, MD, FACS, and James C. Stanley, MD, FACS

The Effect of Hirudin and of an Antibody Directed Against Platelet Membrane Glycoprotein Ib on ePTFE Microvascular Graft Thrombosis.....340
William H. Dascombe, MD, Chull Hong, MD, Kevin O. Garrett, MD, Vicki A. Lyle, BS, Jonathan L. Miller, MD, PhD, and Peter C. Johnson, MD

Postischemic Endothelial Cell Dysfunction Is Attenuated by a Novel Non-anticoagulant Heparin 343
W. Charles Sternbergh III, MD, Michael Sobel, MD, FACS, and Raymond G. Makhoul, MD

Cytokines Modulate Matrix Metalloprotease and TIMP Gene Expression.....346
Kevin D. Nolan, MD, MPH, Charles L. Mesh, MD, Vera P. Shively, MS, William H. Pearce, MD, FACS, Rex L. Chisholm, PhD, and James S. T. Yao, MD, PhD, FACS

Induction of Endogenous Proteinases and Alterations of Extracellular Matrix in a Rat Model of Aortic Aneurysm Formation.....348
Gary B. Nackman, MD, Vivienne Halpern, MD, Raju Gandhi, MD, Evelyn Irizarry, MD, William Ramey, MD, FACS, and M. David Tilson, MD, FACS

Role of the Mechanism of Cholesterol Reduction on Vein Graft Atherosclerosis 351
Hector J. Menchaca, MD, Todd J. Morris, MD, Howard Bourdages, MD, Taylor Neff, MD, Van N. Michalek, BA, Edward Brennan, MD, and Henry Buchwald, MD, PhD, FACS

The Influence of Interleukin-1, Tumor Necrosis Factor, and Interferon-Gamma on the Endothelial Cell Metabolism of Low Density Lipoprotein.....353
John Ligush, Jr, MD, Scott A. Berceli, MD, PhD, Vijay S. Warty, PhD, Jean Chao, MS, Fuad M. Ramadan, MD, Robert F. Labadie, BS, and Harvey S. Borovetz, PhD

Adhesion Molecule Expression in the Aorta of Hypercholesterolemic Rabbits 355
Cornelius A. Davis III, MD, Axel W. Joob, MD, William H. Pearce, MD, FACS, Hartmann Friederici, MD, Jayme Borensztajn, MD, Mary Lou Jelachich, PhD, Rodney Greene, BS, and Robert W. Anderson, MD, FACS

Vascular Permeability Factor (VPF) Speeds Endothelial Repaving Following Arterial Injury 358
Scott Stevens, MD, Eric Choi, MD, Jeffrey Trachtenberg, MD, Dan Connolly, PhD, Charles Rodi, PhD, Ellen McMahon, PhD, Richard Ornberg, PhD, Una Ryan, PhD, and Allan Callow, MD, PhD, FACS

Seeding Balloon-Injured Rabbit Arteries With Autogenous Venous Endothelial Cells Improves Resurfacing but Fails to Attenuate Intimal Hyperplasia 361
Michael S. Conte, MD, Robin P. Choudhury, BA, Motoaki Shirakowa, MD, John T. Fallon, MD, PhD, and Louis K. Birinyi, MD

Lack of Nitric Oxide-Dependent Relaxation of Human Saphenous Vein 363
Daniel B. Walsh, MD, FACS, Joseph G. Magnant, MD, E. Lynne Henderson, BS, Robert J. Wagner, BS, and Jack L. Cronenwett, MD, FACS

Prevention of Postoperative Pericardial Adhesions in a Canine Model by Tissue Precoating with Hyaluronic Acid Solutions 366
Lawrence D. Kaelin, MD, James M. Seeger, MD, FACS, Edward M. Staples, MD, FACS, Yoseph Yaacobi, MD, PhD, Jacqueline C. Bailey, MD, Michael J. Carmichael, MD, FACS, David A. Duncan, MD, Sigurd Normann, MD, James W. Burns, PhD, and Eugene P. Goldberg, PhD

A Demonstration of Significantly Enhanced Neovascularization by Angiogenic Stimulation in the Ischemic Limb.....368
Li-Qun Pu, MD, Zaid Arekat, MD, Roland Brassard, MD, and James F. Symes, MD, FRCSC, FACS

Allograft Venous Valve Transplantation and the Effects of Cryopreservation 371
P. Scott Seibel, MD, Bruce A. Long, MD, J. Bayne Selby, MD, John A. Kern, MD, Barry B. K. Chan, MD, Terry L. Flanagan, MPH, Irving L. Kron, MD, FACS, and Curtis G. Tribble, MD, FACS

Heart Rate and Experimental Carotid Atherosclerosis 373
Hisham S. Bassiouny, MD, Christopher K. Zarins, MD, FACS, Armen Hovanessian, MS, and Seymour Glagov, MD

Platelet-Activating Factor Blockade Inhibits Leukocyte Adhesion to Endothelium in Ischemia–Reperfusion.....376
Vincent J. Milazzo, MD, Frederick Sabido, MD, Robert W. Hobson II, MD, FACS, and Walter N. Durán, PhD

Leukocyte Adhesion Molecule CD11/CD18 Mediates PMN Sequestration in Postischemic Skeletal Muscle–Plasma Factors Stimulate Its Expression During In Vivo Reperfusion.....378
Paul F. Petrasek, MD, Shinta Liauw, MSc, Denis Bailey, MD, PhD, FRCPC, Jeffrey Davidson, BSc, Alexander D. Romaschin, PhD, and Paul M. Walker, MD, PhD, FRCSC

Chapter VIII—Transplantation

Chronic Rejection of Rat Kidney Allografts Can Be Reversed By Retransplantation: Its Later Progression May Be Host Independent 381
Stefan G. Tullius, MD, Uwe W. Heemann, MD, and Nicholas L. Tilney, MD, FRCS, FACS

RS-61443 Inhibits Intimal Hyperplasia in Aortic Allografts 383
D. Michael Steele, MD, Wolf O. Bechstein, MD, Joseph Kowalski, PhD, Lincoln S. Smith, Debra A. Hullett, PhD, Anthony C. Allison, PhD, and Hans W. Sollinger, MD, PhD, FACS

RS-61443 Prevents and Reverses Acute Rejection in a Long-Term Study of Rat Hindlimb Allotransplantation.....385
Prosper Benhaim, MD, Theo B. M. van den Helder, MD, Timothy H. McCalmont, MD, James P. Anthony, MD, and Stephen J. Mathes, MD, FACS

Antibodies to Inducible Interleukin-2 Receptors Prolong Graft Survival in Primate Homograft Transplantation.....388
Gary L. Parenteau, MD, Paul S. Brown, MD, Frederick M. Dirbas, MD, Carolyn K. Goldman, BS, Maria A. Bukowski, BS, Richard P. Junghans, PhD, Otto A. Gansow, PhD, Richard E. Clark, MD, and Thomas A. Waldmann, MD

Anti-CD2 and Anti-CD3 Monoclonal Antibodies Synergize to Prolong Allograft Survival and Decrease the Associated Cytokine Syndrome 391
Kenneth D. Chavin, MD, and Jonathan S. Bromberg, MD, PhD, FACS

Multiple Mechanisms of Anti-CD2 Immunosuppression: Receptor Blockade, Generation of Suppressors, and Alteration of Cytokine Production.....393
Jonathan S. Bromberg, MD, PhD, FACS, and
Kenneth D. Chavin, MD

Increased Efficacy of Cyclosporin Liposomes in a Rat Orthotopic Liver Transplant Model.....395
Chris E. Freise, MD, Tao Liu, MD, Keelung Hong, PhD,
Demetrios Papahadjopoulos, PhD,
Nancy L. Ascher, MD, PhD, FACS, and
John P. Roberts, MD, FACS

Hypothermic Ischemia and Reperfusion Induces a Specific Vascular Permeability Defect in Isolated Rat Livers 397
Karen Chun, MD, James Biewer, BS, David Ferguson, BA, and
Mark G. Clemens, PhD

Successful Cold Storage Preservation of the Canine Pancreas for 96 Hours Using University of Wisconsin Solution Containing the Thromboxane A2 Synthesis Inhibitor OKY046.....400
Seikon Kin, MD, PhD, Yugi Shinagawa, MD, PhD,
Edic Stephanian, MD, Benoit Barrou, MD, Paul Gores, MD,
Rainer Gruessner, MD, PhD, and David E. R. Sutherland, MD, PhD

Cytokine Patterns in Hepatorenal Syndrome: Reversible Renal Dysfunction Associated With High Levels of Peripheral and Hepatic Vein Interleukin-6 and Tumor Necrosis Factor in the Acutely Failing Liver 403
George W. Burke, MD, Robert Cirocco, MS, David Roth, MD,
John Fernandez, MD, Mustafa Allouch, MD, Mike Markou, BS,
Rajender Reddy, MD, Lennox Jeffers, MD, Eugene Schiff, MD,
Jose Nery, MD, and Joshua Miller, MD

The Role of Antibody in Cardiac Graft Rejection in Hypersensitized Recipients: Prevention of Antibody Response and Graft Rejection Using Brequinar Sodium 406
Chikao Yasunaga, MD, Donald V. Cramer, DVM, PhD, Frances A. Chapman, AHT, Hong Kai Wang, MD, Michelle Barnett, BS, Guo-Du Wu, MD, and Leonard Makowka, MD, PhD

Quantitation of Steroid-Induced Reversal of Myocardial Contractile Dysfunction During Early Cardiac Allograft Rejection 408
Robert T. Pyo, BS, John S. Pirolo, MD, Richard B. Schuessler, PhD, Robert D. B. Jaquiss, MD, Jeffrey E. Saffitz, MD, PhD, and T. Bruce Ferguson, Jr, MD

Intrathymic Inoculation of Purified T Cells Induces Unresponsiveness to Rat Cardiac Allografts..... 411
Jon S. Odorico, MD, James F. Markmann, MD, PhD, Andrew M. Posselt, BS, Clyde F. Barker, MD, FACS, and Ali Naji, MD, PhD, FACS

Inhibition of B7-Induced CD28 T-cell Activation With CTLA4Ig Prevents Cardiac Allograft Rejection: Evidence for Costimulation ... 413
Steven F. Bolling, MD, FACS, Laurence A. Turka, MD, Ru-Qi Wei, MD, Peter S. Linsley, PhD, Craig B. Thompson, MD, and Hua Lin, MD

Transcription of Interleukin-8-like and Cytotoxic T-cell-specific Serine Esterase Genes in Allograft Recipients Is Prevented by Rapamycin Treatment 416
Georg Schmidbauer, MD, Kenneth J. Wieder, PhD, Cindy L. Corpier, MD, Irene Wieder, MS, Tomasz Sablinski, MD, PhD, Terry B. Strom, MD, and Jerzy W. Kupiec-Weglinski, MD, PhD

The Molecular Biology of Cardiac Transplantation: Understanding a Murine Model of Allograft Rejection and Tolerance 419
Vincent Ruggiero, BS, Susan Rostami, BS, Gary M. Kline, MD, Muhammad Mohiuddin, MD, and Verdi J. DiSesa, MD, FACS

Mechanisms for In Vitro Xenoreactivity in Mouse + Rat → Mouse Chimeras 421
Sherry M. Wren, MD, Ngoc L. Thai, BS, Stewart C. Wang, MD, John J. Fung, MD, PhD, and Suzanne T. Ildstad, MD

Selective Intraportal Hepatocyte Transplantation 423
Michael D. Holzman, MD, Jacek Rozga, MD, PhD, Daniel F. Neuzil, MD, Donald W. Griffin, MD, and Achilles A. Demetriou, MD, PhD, FACS

Gonadal Vein Endothelia Used to Demonstrate Relative Endothelial Versus Macrophage Alloantigenicity 426
Emina H. Huang, MD, Claudia J. Morgan, PhD, Patrick W. Adams, CHT, Ronald M. Ferguson, MD, PhD, and Charles G. Orosz, PhD

First Host Lymphocyte Contact With Acutely Rejecting Kidneys in Rats Depends on Adhesion Molecules and Not on Prior Sensitization 429
Uwe W. Heemann, MD, Stefan G. Tullius, MD, and Nicholas L. Tilney, MD, FRCS, FACS

Expression of Adhesion Molecules by Lung Allografts.....431
Michael S. Mulligan, MD, Donald L. Swiderski, PhD, Peter A. Ward, MD, G. Michael Deeb, MD, FACS, and Flavian M. Lupinetti, MD, FACS

Nitric Oxide Inhibits the T-cell Receptor-Mediated Ca^{2+} Second Messenger System.....434
Mark L. Jordan, MD, FRCSC, Barbara Rominski, BS, Sue Hignet, BS, Rosemary A. Hoffman, BS, Joe Stadler, MD, Timothy R. Billiar, MD, and Richard L. Simmons, MD, FACS

Elimination of MHC Class I Antigen Prolongs Islet Allograft Survival 436
Robert W. Osorio, MD, Peter G. Stock, MD, PhD, Chris E. Freise, MD, Sheri Krams, PhD, Olivia Martinez, PhD, John P. Roberts, MD, FACS, Rudolf Jaenish, MD, and Nancy L. Ascher, MD, PhD, FACS

Chapter IX—Oncology

High-Dose Hepatic Arterial Adriamycin With Systemic Protection Provided by a Novel Hepatic Venous Isolation Catheter and Extracorporeal Chemofiltration 440
George M. Fuhrman, MD, David C. Hohn, MD, FACS, and Steven A. Curley, MD

Comparison of Various Hepatic Devascularization Methods in the Treatment of Liver Cancer 443
Rong Yang, MD, Carlos A. Galliani, MD, Frederick J. Rescorla, MD, FACS, and Jay L. Grosfeld, MD, FACS

Reversal of Abnormal Hepatic Metabolism by Tumor Removal 447
Katherine J. M. Liu, MD, FACS, Yifat O. Drucker, MS, Robert A. Kleps, PhD, Thomas O. Henderson, PhD, and Lloyd M. Nyhus, MD, FACS

CD44 Mediates Adhesion of Colorectal Carcinoma to Basement Membrane and Extracellular Matrix 450
Seiichi Ishii, MD, Rosilyn Ford, BS, Peter Thomas, PhD, Glenn Steele, Jr, MD, PhD, FACS, and J. Milburn Jessup, MD, FACS

Cell Proliferation in Colorectal Cancer and Its Relation to Prognosis...453
Ibrahim Al-Sheneber, MD, Henry R. Shibata, MD, FRCSC, FACS, John Sampalis, PhD, and Serge Jothy, MD, PhD, FRCPC

Perioperative Granulocyte–Macrophage Colony-Stimulating Factor Reduces Postoperative Tumor Growth.....455
Arnold D. Hill, MB, H. Paul Redmond, FRCSI, Hassan Nama, FRCSI, Pierce A. Grace, FRCSI, and David Bouchier-Hayes, MD, FACS

Temporal Expression of the Gastrin (CCK-B) Receptor in Azaserine-Induced Pancreatic Carcinogenesis 457
Stephen P. Povoski, MD, Weigong Zhou, MD, PhD, Nancy Rosen, BS, Daniel S. Longnecker, MD, and Richard H. Bell, Jr, MD, FACS

In Vivo Inhibition of Pulmonary Metastasis of Human Bladder Cancer Cells With the Use of Protease Inhibitor 460
David C. M. Teng, BS, Robert E. Weiss, MD, Michael J. Droller, MD, FACS, and Brian C.-S. Liu, PhD

Presymptomatic Genetic Testing for Familial Medullary Thyroid Carcinoma.....462
Terry C. Lairmore, MD, James R. Howe, MD, Shenshen Dou, MS, David Chi, MD, Katrin Carlson, BS, Santosh K. Mishra, PhD, Samuel A. Wells, Jr, MD, FACS, and Helen Donis-Keller, PhD

Interleukin-8 Suppresses Interleukin-2-Induced Toxicity.....465
B. Todd Heniford, MD, Michael J. Edwards, MD, FACS, Elizabeth A. Klar, MS, and Frederick N. Miller, PhD

Metabolism of Normal Breast and Human Breast Carcinoma Cells by ^{31}P-Nuclear Magnetic Resonance Spectroscopy.....468
Samuel Singer, MD, Ruth Sager, PhD, Craig Gostin, BA, Timothy J. Eberlein, MD, FACS, and Leo J. Neuringer, PhD

Transfection of Human Renal Cell Carcinoma With Interleukin-2 or Interferon-α Abrogates Tumorigenicity In Vivo 470
Thomas Duckett, MD, Robert S. Lavey, MD, William H. McBride, PhD, Cho-Lea Tso, Tsuneaki Sakata, PhD, and Arie S. Belldegrun, MD

Retroviral-Mediated Gene Transfer Into Human Tumor-Infiltrating Lymphocytes 472
Alexander R. Miller, MD, Michael J. Skotzko, MS, Cho-Lea Tso, MS, Randhir Kaboo, MD, Arie S. Belldegrun, MD, Charles F. Chandler, MD, Kristina Rhoades, BS, Donald B. Kohn, MD, and James S. Economou, MD, PhD, FACS

Generation of Therapeutic Lymphocytes After In Vivo Transfection of a Tumor With a Gene Encoding Allogeneic Class I Major Histocompatibility Complex Antigen 476
Wendy L. Wahl, MD, Gregory E. Plautz, MD, Bernard A. Fox, PhD, Gary J. Nabel, MD, PhD, Suyu Shu, PhD, and Alfred E. Chang, MD, FACS

Retroviral Gene Transduction of Circulating Progenitor Cells in Patients With Cancer 478
Robert E. Coles, AB, Terence J. Boyle, MB, BSc, FRCSI, Joanne Kurtzberg, MD, Alice Stewart, William P. Peters, MD, PhD, and H. Kim Lyerly, MD

Effect of Insulin-like Growth Factor-1 and Insulin Treatment on Tumor Cachexia 482
K. Fon Huang, MD, Yuan-Lin Dong, MD, R. Y. Declan Fleming, MD, David N. Herndon, MD, FACS, Tina Z. Yan, MS, and J. Paul Waymack, MD, ScD, FACS

The First Target Cell System for Studying the Cellular Cytolytic Response Against Autologous Strains of Human Immunodeficiency Virus-1 484
Paul M. Ahearne, MD, Richard A. Morgan, PhD, Mark W. Sebastian, MD, Dani P. Bolognesi, PhD, and Kent J. Weinhold, PhD

Immunosuppressive Activity of an Envelope Protein Fragment Derived From the Tumor-Associated Human Endogenous Retroviral Sequence Clone 4-1 487
David M. Hyams, MD, FACS, Paul E. Steele, MD, Carole Distler, MA, Jaishree Hariharan, MD, and Joseph Solomkin, MD, FACS

Retroviral-Mediated Gene Transfer of Antisense K-*ras* Suppresses Tumor Growth in an Orthotopic Lung Cancer Model 490
Renee N. Georges, MD, Yujiao Zhang, MD, Tapas Mukhopadhyay, PhD, and Jack A. Roth, MD, FACS

Effects of Interleukin-8, Interleukin-2, and Fresh Tumor Culture Supernatant on In Vitro Migration by Human Peripheral Blood Mononuclear Cells and Lymphokine-Activated Killer Cells 492
Richard K. Ivey, MD, Richard M. Sherry, MD, and John P. Wei, MD

Adjuvant Treatment With Stimulated Lymphocytes From Draining Lymph Nodes (DLN) Improves Survival After Surgical Resection in a Murine Model 494
Leigh S. Hamby, MD, Patrick C. McGrath, MD, and James W. Freeman, PhD

Evidence That Tumor Cells With Nonmodal DNA Content Are Capable of Continued Proliferation 497
Paul Lin, MD, Stuart Lipnick, MD, and David C. Allison, MD, PhD

Anti-T-cell Receptor Vβ11 Monoclonal Antibody Augments Interleukin-2/Interferon Immunotherapy of Pulmonary Metastases 499
Benjamin Kim, MD, FACS

Chapter X—Gynecology and Obstetrics

Radical Hysterectomy is Acceptable Therapy for Patients With Bulky Early-Stage Cervical Cancer.....502
Ronald D. Alvarez, MD, Mark S. Gelder, MD, Hazel Gore, BS, Seng-Jaw Soong, PhD, and Edward E. Partridge, MD, FACOG, FACS

Endoscopic Catheterization of Placental Vessels for Chronic Fetal Vascular Access.....504
Marc H. Hedrick, MD, Russell W. Jennings, MD, Thomas E. MacGillivray, MD, Alan W. Flake, MD, H. Peter Lorenz, MD, James M. Estes, MD, Lora Roberts, BS, N. Scott Adzick, MD, FACS, and Michael R. Harrison, MD, FACS

The Safety and Efficacy of Panniculectomy at the Time of Pelvic Surgery.....506
Jonathan A. Cosin, MD, John L. Powell, MD, FACOG, FACS, Julia T. Donovan, MD, FACOG, and Kristen Stueber, MD, FACS

Pancreatic Exocrine Protein Concentrations in Amniotic Fluid Are Elevated in Duodenal, but Not Distal, Small Bowel Atresia 508
Yvonne G. Gollin, MD, Gerald Gollin, MD, Christine R. Marks, BA, and William H. Marks, MD, PhD, FACS

A Double-Blind Study of the Impact of Postoperative Analgesics on Health Care Utilization 510
Miles Tommeraasen, MD, Donald Mehlisch, DDS, MD, Warren Otterson, MD, Michael Trierweiler, MD, Thomas Maneatis, MD, Lincoln Bynum, MD, Eileen DiGiorgio, RN, and LeRoy H. Stahlgren, MD, FACS

Laparoscopic-Directed Ovarian Cystectomy 513
B. Michael Weber, MD, Cecil A. Long, MD, and Bryan D. Cowan, MD

Kinetics of Peritoneal Adhesion Formation in a Rat Model 515
Elizabeth Spinuzza Harris, MD, George T. Rodeheaver, PhD, and Raymond F. Morgan, MD, DMD, FACS

Bowel Hypoxia During Pneumoperitoneum: Effect of Gas and Pressure 517
Nana A. Pianim, MD, Sandor Dubecz, MD, Stanley R. Klein, MD, FACS, and Frederic S. Bongard, MD, FACS

Ultrasound-Guided Transvaginal Aspiration of Pelvic Abscesses 520
Robert Sinow, MD, Anita Nelson, MD, Richard Renslo, MD, M. Jamie Lee, MD, Fikret Atamdede, MD, Donald Mayekawa, MD, and John Gunning, MD

Laparoscopic Management of Ectopic Pregnancy.....522
Soheil Amin-Hanjani, MD, Ricardo Yazigi, MD, and Ashwin Chatwani, MD

Premature Births in Female Renal Transplant Recipients: Degree and Effect of Immunosuppressive Regimen.....524
Karl M. Ahlswede, MD, Vincent T. Armenti, MD, PhD, Michael J. Mortiz, MD, FACS, Beth Anne Ahlswede, BS, Bruce E. Jarrell, MD, FACS, and Robert J. Israel, MD

Chapter XI—Neurologic Surgery

Rapid Transferrin Receptor Determination on Human Brain Tumors...526
Dennis Y. Wen, MBBS, Walter A. Hall, MD, Aslak Godal, PhD, and Oystein Fodstad, MD, PhD

Effect of Warm Storage on Sigma Receptor Parameters in C6 Rat Glioma 528
Ana Cecilia Guajardo, BS, Mariana M. Belcheva, PhD, Kym C. Tolman, BA, Carmine J. Coscia, PhD, and Frank E. Johnson, MD, FACS

Lovastatin as an Adjunct Agent in Brain Tumor Chemotherapy.....530
Donald S. Soloniuk, MD, and Eddie Perkins, MS

Characterization of Human Gliomas Using Chemiluminescent Identification and Quantitation of Intracellular Proteins 532
William C. Welch, MD, Paul L. Kornblith, MD, and Margaret K. Bradley, PhD

Interaction of Acidic Fibroblast Growth Factor and Transforming Growth Factor-β on Bovine and Porcine Endothelium In Vitro 535
Timothy C. Ryken, MD, and Vincent C. Traynelis, MD

Nitrogen Loss During Isolated Closed-Head Trauma Is Associated With Elevated Proteolysis and Amino Acid Oxidation 538
Paul J. Flakoll, PhD, Laura S. Wentzel, BS, and Steve Alan Hyman, MD

Mechanism of Hypertensive Response to Global Cerebral Ischemia..540
Robert F. Heary, MD, Abbott J. Krieger, MD, and Hreday N. Sapru, PhD

Neurosurgical Sequelae of Cocaine Use 543
Richard D. Fessler, MD, and Fernando G. Diaz, MD, PhD

Cerebellar Cortical Reorganization Following Peripheral Deafferentation 545
John Peter Gruen, MD, Josee Morissette, BS, and Jim Bower, PhD

Outcome Following Decompressive Craniectomy for Acute Intraoperative Brain Swelling Associated With Blunt Head Trauma..548
J. Paul Elliott, MD, Peter D. LeRoux, MD, Matthew A. Howard, MD, M. Sean Grady, MD, David W. Newell, MD, and H. Richard Winn, MD, FACS

Chapter XII—Orthopaedic Surgery

Digit Separation in Hand Culture Model Requires Retinoic Acid.....551
Cary Canoun, MD, Celia Ma, Randolph Sherman, MD, FACS, John Reinisch, MD, and Anthony C. Sank, MD

Isolation and Characterization of Heparin-Binding Growth Factor From Canine Flexor Tendons.....554
Frederick J. Duffy, Jr, MD, John G. Seiler, MD, Charles A. Hergrueter, MD, and Richard H. Gelberman, MD

Delivering Local Factors to Assist Tissue Healing 556
J. Allen Stevick, MD, Lorna S. Putnam, BA, and Paul A. Lucas, PhD

Laser Doppler Measurement of Cutaneous Blood Flow in a Rabbit Hind-Limb Compartment Syndrome.....558
John M. Taylor, MD, Jeffrey S. Palmer, MD, Robert D. Goldstein, MD, FACS, Walter Leon, RT, and Warren W. Wetzel, MD, FACS

Functional Properties of Nerve-Repaired Vascular-Intact Muscle Grafts in Young, Adult, and Old Rats.....561
Edwin G. Wilkins, MD, V. A. Kadiresan, MS, Cheryl Hassett, and John A. Faulkner, PhD

Nerve Recovery Following Quantitative Crush Injury 563
Long-en Chen, MD, Anthony V. Seaber, and James R. Urbaniak, MD

The Effect of Denervation on EDRF-Dependent Relaxation in the Cremaster Muscle 565
Andre Gazdag, MD, Long-en Chen, MD, Per Otto Hagen, MD, Anthony V. Seaber, and James R. Urbaniak, MD

The Role of Limited Sarcomere Extensibility in the Localization of Muscle Strain Injury.....567
Ashok S. Reddy, MD, Michael K. Reedy, MD, Anthony V. Seaber, and William E. Garrett, Jr, MD, PhD

Moderate Hypothemia During Tourniquet Ischemia Improves Postischemic Muscle Function and Correlates With High-Energy Phosphate Levels.....569
Axel Marx, MD, Paul-Martin Sutter, MD, Lorenz Gürke, MD, Peter Erhard, Michael Heberer, MD, Jonas Landmann, MD, and Felix Harder, MD, FACS

Experimental and Clinical Examination of the Gamma Nail Osteosynthesis in Inter- and Subtrochanteric Fractures 572
Wilhelm Friedl, MD, FACS, Josef Stern, MD, and Ullrich Mieck, MD

Treatment of Acute Septic Bursitis: A Randomized Prospective Comparison of Three Drainage Methods 576
Jeffrey L. Zilberfarb, MD, William L. Hennrikus, MD, Mark T. Reis, MD, Anthony T. LaRocco, MD, and John A. Ungersma, MD

Chapter XIII—Otorhinolaryngology

Evoked Vestibular Responses in the Chinchilla 579
Robert P. Muckle, MD, John H. Anderson, MD, PhD, and Samuel C. Levine, MD

Postoperative Sensorineural Hearing Loss in Thyroidectomy and Parathyroidectomy Patients.....581
William A. McClelland, MD, Lawrence W. Robinson, MD, and Anthony T. Cacace, PhD

Epidermal Growth Factor Receptor (EGF-R) mRNA Is Focally Overexpressed in Murine Head and Neck Cancer 585
Briana W. Heniford, MD, Brian Hawkins, MD, Serge A. Martinez, MD, and Fred J. Hendler, MD, PhD

The Efficacy of DMSO in Treating Island Flaps 587
Robert J. Carpenter, MD, Michael F. Angel, MD, and Raymond F. Morgan, MD

The Ventral "L" Island Flap: An Anatomic Study and the Effect of Venous Outflow Sampling on Flap Survival.....589
Clark A. Rosen, MD, and James I. Cohen, MD, PhD, FACS

Biochemical Analysis of the Transition Zone in Ischemic Skin Flaps 591
Michael F. Angel, MD, Michael J. Im, PhD, and Paul N. Manson, MD

DT Diaphorase Activity: Upregulation in Preconditioned Skin Following Oxidant Stress.....593
Gilson Kingman, MD, Riley S. Rees, MD, Belinda Cashmer, MS, Chris Reeves, BS, and David J. Smith, Jr, MD

The Augmentation of Delay Phenomenon by Allopurinol 596
Sai S. Ramasastry, MD, Prakash Mullick, MD, PhD,
Frank Aloi, BS, Krishna Narayanan, MD, Robert E. Basford, PhD,
Nicola Cecchino, BS, and J. William Futrell, MD, FACS

The Anatomical Position of the Medial and Lateral Canthus 598
Warren Schubert, MD, Naomi Quillopa, RN, David A. Siegel, BS,
Heather L. Hollander, MD, Jeffery H. Aldridge, MD, PhD, and
Bruce L. Cunningham, MD

Chapter XIV—Pediatric Surgery

Effects of Immunosuppression on Organ Localization and Growth of Blood-Borne Yeasts 601
Frederick J. Rescorla, MD, FACS, Glenn N. Merkel, PhD,
Walter J. Folkening, BSc, Eva Gankiewicz, MS,
Raoul Rosenthal, PhD, and Jay L. Grosfeld, MD, FACS

N-*myc* Oncogene Enhances the Sensitivity of Neuroblastoma to Killing by Newcastle Disease Virus 603
Kirk W. Reichard, MD, Robert M. Lorence, MD, PhD,
Christopher J. Cascino, MD, Mark E. Peeples, PhD,
Robert J. Walter, PhD, and Hernan M. Reyes, MD, FACS

Gastrin Releasing Peptide Is an Autocrine Growth Factor for Human Neuroblastoma 606
Robert S. Sawin, MD, John Brockenbrough, BS, and
Janice C. Ness, PhD

Regulation of Tumor Growth by Antibody to a Novel Autocrine Growth Factor 609
Charles E. Bagwell, MD, FACS, James L. Harper, MD,
Patricia D. Lawman, PhD, and Michael J. P. Lawman, PhD

Hypoxia Increases Smooth Muscle Hyperplasia in Vein Interposition Grafts: Prevention by Cyclosporin A.....614
Alexander D. Soutter, MD, Nicholas C. Saenz, MD, and Judah Folkman, MD, FACS

In Situ Y Chromosome Identification of Transplanted Hepatocytes ..617
Jordan W. Eckert, MD, Carla S. Buerkle, BS, Milton J. Feingold, MD, Angela M. Major, HT, and Mary L. Brandt, MD

Intraportal Donor-Specific Transfusion 24 Hours Pretransplant With Cyclosporin Is Effective in Prolonging Small Bowel Transplant Survival.....619
Annie Fecteau, MD, Jean I. Tchervenkov, MD, FRCSC, Frank M. Guttman, MD, FACS, Tsuyoshi Takara, MD, Sandeep Mayer, MD, Alexandre Lubin, MD, and Eliezer Rosenmann, MD

Neonatal Heterotopic Reduced-Volume Lung Transplantation for Congenital Diaphragmatic Hernia 621
Daniel P. Ryan, MD, FACS, Hon-Chi Suen, MBBS, FRCS, Daniel P. Doody, MD, FACS, Dean M. Donahue, MD, and John C. Wain, MD

Fetal Pulmonary Artery Smooth Muscle Cells Produce Nitric Oxide in Response to Lipopolysaccharide (LPS) and Cytokines.....623
Don K. Nakayama, MD, FACS, Paul Davies, PhD, Bruce R. Pitt, PhD, Vincent H. Chough, Richard L. Simmons, MD, FACS, and Timothy R. Billiar, MD

Fetal Mouse Limb Explants: Regenerative Tissue Repair Occurs in an Unperfused System.....626
John C. Bleacher, MD, Vincent R. Adolph, MD, Peter W. Dillon, MD, and Thomas M. Krummel, MD, FACS

Vascular Considerations in Correction of Congenital Diaphragmatic Hernia 629
Russell W. Jennings, MD, Thomas E. MacGillivray, MD, Abraham M. Rudolph, MD, Ernest J. Ring, MD, N. Scott Adzick, MD, FACS, and Michael R. Harrison, MD, FACS

The Stress Response During Fetal Surgery Is Blocked by Total Spinal Anesthesia 631
Kathleen N. Fenton, MD, Markus K. Heinemann, MD, Paul R. Hickey, MD, and Frank L. Hanley, MD

Chapter XV—Plastic Surgery/Wound Healing

Intraocular Hypertension After Orbital Volume Reduction With Graft Material 635
William M. Kuzon, Jr, MD, PhD, FRCSC, Christopher R. Forrest, MD, MSc, FRCSC, and John Phillips, MD, MSc, FRCSC

Silicone Tissue Assays in Nonaugmented Cadaveric Patients: Is There a Baseline Level? 638
Gregory R. D. Evans, MD, Sheri Slezak, MD, and Michael F. Rieders, PhD

Laparoscopic Retrieval of the Omental Free Flap 639
Renato Saltz, MD, Robert Stowers, PA-C, and Thomas Gadacz, MD, FACS

Generation of Platelet-Activating Factor During Free Tissue Transfer Primes Neutrophil Superoxide Anion Production 641
John M. Pitman III, MD, Daniel R. Ambruso, MD, Christopher K. Law, MD, and Lawrence L. Ketch, MD

Effects of Hypothermia and Hyperbaric Oxygen Preservation on the Xanthine Oxidase System in Free Flaps 643
Hyo-Kyung Chung, MD, Michael F. Angel, MD, Craig A. Vander Kolk, MD, FACS, Michael J. Im, PhD, and Paul N. Manson, MD, FACS

Reconstruction of Complex Skeletal Defects With Flap Tissue Differentiation 645
Roger K. Khouri, MD, Basem Koudsi, MD, Louis A. Gilula, MD, Wang Xi, MD, Dai Baio, MD, Yvonne Taylor, PhD, and A. Hari Reddi, PhD

A Reperfusion Interval Preserves Neuromuscular Contractile Function Following Tourniquet Ischemia 648
Brett E. Stompro, MD, Thomas R. Stevenson, MD, Richard C. Carlsen, PhD, Robert B. Sharman, BS, and Mark A. Wineinger, MD

Living Artificial Nerve Guides 651
David J. Bryan, MD, Patricia L. Eby, MD, Paul D. Costas, MD, Kai-Kai Wang, MD, Dimitria P. Chakalis, and Brooke R. Seckel, MD

Topical Wound Therapy: The Impact of Commonly Used Agents on Epithelialization and Neovascularization 653
Dorthe Kjølseth, MD, Johannes M. Frank, MD, John H. Barker, MD, PhD, Al Rosenthal, MD, Robert D. Acland, MD, FRCS, Gary L. Anderson, PhD, and Gordon R. Tobin, MD, FACS

Evaluation of Neutrophil Function in Irradiated Tissue 656
Christian J. Gabka, MD, Prosper Benhaim, MD, Albert S. Chan, RTT, Heinz Scheuenstuhl, AB, and Stephen J. Mathes, MD, FACS

Retinol and Insulin-like Growth Factor-1 Accelerate Tracheal Epithelium Repair in Sheep 659
Cheng Z. Wang, MD, Robert E. Barrow, PhD, Michael J. Evans, PhD, San F. Yang, MD, and David N. Herndon, MD

Increases in Type III Collagen Gene Expression and Protein Synthesis in Patients With Inguinal Hernia 662
David W. Friedman, MD, Charles D. Boyd, PhD, James W. Mackenzie, MD, FACS, and Susan B. Deak, PhD

Temporal Expression of Basic Fibroblast Growth Factor During Wound Healing 664
Harold Brem, MD, Yuen Shing, PhD, Hiroyuki Watanabe, MS, George Tamvakopoulis, BS, Moshe Marikovsky, PhD, Peter M. Vogt, MD, Michael Klagsbrun, PhD, Jeffrey Grosfeld, BA, Elof Eriksson, MD, FACS, and Judah Folkman, MD, FACS

In Vivo Expression of Fibroblast Growth Factors During Repair 667
Michael T. Longaker, MD, Sabine Werner, PhD, Kevin G. Peters, MD, Frances Fuller-Pace, PhD, Michael J. Banda, PhD, and Lewis T. Williams, MD, PhD

Transforming Growth Factor-Beta Stimulates Ornithine Decarboxylase in Murine Fibroblasts 670
R. Daniel Beauchamp, MD, Tien C. Ko, MD, Courtney M. Townsend, Jr, MD, FACS, and James C. Thompson, MD, FACS

Gene Regulation of Macrophage Transforming Growth Factor-Beta in Wound Healing 672
James Chang, BAS, Michael T. Longaker, MD, Thomas K. Hunt, MD, FACS, and Michael J. Banda, PhD

Diabetic Tissue Repair: The Role of Endothelial Cells and Basement Membrane 675
James J. Reid, BS, Khodam Rostami, BS, Tai Lan Tuan, PhD, Delia Ertl, MS, Marcel Nimni, PhD, Fred A. Weaver, MD, FACS, Albert E. Yellin, MD, FACS, David Wei, MS, and Anthony C. Sank, MD

Wounding Downregulates Diabetic Fibroblasts 677
Ahmed Abdullah, MD, Linda G. Phillips, MD, FACS, Huai Quin Huang, MD, Francis Ko, Sabrina Trieff, and Martin C. Robson, MD, FACS

Insulin-like Growth Factors 1 and 2, in Combination With Fibroblast Growth Factor, Improve Wound Healing in Diabetic Mice 680
Steven Albertson, MD, Robert P. Hummel III, MD, Matthew P. Breeden, BS, and David G. Greenhalgh, MD

Interrelationships Between Growth Factor Messenger RNA and Protein Product in the Healing Wound 683
Madeline H. Gartner, MD, Lee A. Aberle, BS, John R. Richards, MS, and Michael D. Caldwell, MD, PhD, FACS

Response of Keloid and Normal Dermal Fibroblasts to Wounding In Vitro 685
Marlene S. Calderon, BS, Hongliang Yin, MD, Albert J. Banes, PhD, and W. Thomas Lawrence, MD, FACS

Altered Cytokine Response of Hypertrophic Scar Fibroblasts 688
Warren L. Garner, MD, Soverin Karmiol, PhD, Jorge L. Rodriguez, MD, Cynthia Marcelo, PhD, Sem H. Phan, PhD, and David J. Smith, Jr, MD

In Vitro/In Vivo Expression of Human Growth Hormone in Porcine Keratinocytes After Retroviral Gene Transfer 691
Peter M. Vogt, MD, Simon Thompson, PhD, Yvonne Zeckel, BA, Thomas Binder, BA, Richard C. Mulligan, PhD, and Elof Eriksson, MD, FACS

Scarless Fetal Skin Repair Is Intrinsic to the Fetal Fibroblast 694
H. Peter Lorenz, MD, Michael T. Longaker, MD,
David J. Whitby, MD, Michael R. Harrison, MD, FACS, and
N. Scott Adzick, MD, FACS

Collagen Regulation in Fetal Skin Wounds.....697
Rahul K. Nath, MD, William Parks, PhD, Herbert Markham, RVT,
and Paul M. Weeks, MD, FACS

Regulation of Collagen Synthesis During Fetal Tissue Repair.....700
Frazier W. Frantz, MD, Dorne R. Yager, PhD,
Robert F. Diegelmann, PhD, and I. Kelman Cohen, MD, FACS

The Role of Hyaluronidase Activity on Extracellular Matrix
Composition in Fetal Wounds.....702
Vincent R. Adolph, MD, John C. Bleacher, MD,
Peter W. Dillon, MD, and Thomas M. Krummel, MD, FACS

Collagen Synthesis and Cell Proliferation by Fetal Dermal Fibroblasts
Are Coordinately Controlled.....704
Bruce A. Mast, MD, Robert F. Diegelmann, PhD,
Thomas M. Krummel, MD, FACS, and
I. Kelman Cohen, MD, FACS

Studies in Fetal Bone Repair: Influence of Environment Versus Tissue
Origin on Bone Graft Survival 706
Daniel A. DelVecchio, MD, Michael T. Longaker, MD,
Daniel E. O'Hara, MD, Scott P. Bartlett, MD,
Linton A. Whitaker, MD, FACS

An Assessment of Postnatal Growth After In Utero Long Bone
Osteotomy With Fixation.....709
Jeffrey A. Goldstein, MD, Jeffrey C. Posnick, DMD, MD,
Mark D. Wells, MD, R. Kendrick Slate, MD, and
Paul S. Thorner, MD, PhD

Total Reversal of Hypoxic Wound Healing Deficit by Hyperbaric Oxygen Plus Growth Factors 711
Lily L. Zhao, MD, John D. Davidson, MD, Liancun Wu, MD, and Thomas A. Mustoe, MD, FACS

The Effect of Interleukin-1β on the Inhibition of Contraction of Excisional Wounds Caused by Bacterial Contamination 715
Ahmet Kucukcelebi, MD, Po-Sheng Hui, MD, Keiichiro Sahara, MD, Francis Ko, BS, and Martin C. Robson, MD, FACS

The Differential Effects of 21-Aminosteroids on Wound Healing 716
Thomas P. Paxton, MD, Ronald H. Miles, MD, and Richard L. Gamelli, MD, FACS

Burn Wound Sepsis: Beneficial Effects of Rapid Chemical Debridement 719
Tseung H. Chang, PhD, Vincent Naman, MD, Felix Martinez, MD, Raul Mejia, MD, Larry Freundlich, MA, Eli Seifter, PhD, and Stanley M. Levenson, MD

Elevations in Red Blood Cell Mass Reduce Cardiac Index Without Altering the Oxygen Consumption in Severely Burned Patients 721
Dennis C. Gore, MD, Eric J. DeMaria, MD, and H. David Reines, MD, FCCM, FACS

Chapter XVI—Urology/Reproductive Biology

Castration-Induced Apoptosis in the Rat Penis 724
Alexis E. Te, MD, Marc Colombel, MD, Harry P. Koo, MD, Steven A. Kaplan, MD, Ralph Buttyan, PhD, Carl A. Olsson, MD, FACS, and Ridwan Shabsigh, MD

The Effect of Transforming Growth Factor-Beta (TGF-β) on Androgen Receptor mRNA Levels in Cultured Rat Corpora Cavernosal Smooth Muscle Cells 726
Andrew L. Freedman, MD, Nestor F. Gonzalez-Cadavid, PhD, and Jacob Rajfer, MD, FACS

Scanning Electron Micrographic Evidence for a Nuclear Annulus in Human Spermatozoa 730
Joseph G. Barone, MD, Rajesh Patel, Kenneth B. Cummings, MD, FACS, and W. Steven Ward, PhD

Neutrophil (PMN) CD18 Integrin Mediates Endotoxin-Induced Intrarenal PMN Sequestration 732
Ronald P. Kaufman, Jr, MD, Brian K. McCandless, MD, and Asrar B. Malik, PhD

The Effect of Resting Pressure and Stimulation Frequency on Squeeze Pressure in a Canine Electrostimulated Stomal Neosphincter 734
W. Donald Buie, MD, MSc, FRCSC, W. Douglas Wong, MD, FRCSC, FACS, John A. Heine, MD, FRCSC, Brett T. Gemlo, MD, Ann C. Lowry, MD, Robert D. Madoff, MD, and David A. Rothenberger, MD, FACS

The Effect of Fibroblastic Growth Factor Antagonists on Growth of Benign Prostate Hyperplasia in Transgenic Mice 736
George T. Ho, MD, Michael L. Lu, PhD, Philip Leder, MD, and Jerome P. Richie, MD, FACS

N-(4-Hydroxyphenyl)Retinamide-Induced Cytotoxicity of Cultured Human Prostatic Carcinoma Cells 738
Cary N. Robertson, MD, Kathryn R. Kidd, BS, Jeffrey C. Pence, MD, Donald L. Trump, MD, and Robert L. Fine, MD

Inhibition of Growth and Invasion in Human Prostatic Carcinoma Cell Lines by *N*-Retinamide 740
Stephen P. Guss, MS, MD, Gerald W. Chodak, MD, and Daniel B. Rukstalis, MD

Growth Regulation of Human Androgen-Sensitive and -Resistant Prostate Cancer Cells by 13-*cis*-Retinoic Acid 742
Perinchery Narayan, MD, Rajvir Dahiya, PhD, Badrinath Konety, MD, John Kurhanewicz, PhD, and Bryan Boyle, BA

Modulation of Hormone Sensitivity in PC3 Cells by Transfection of a Normal Human Androgen Receptor 745
Nora M. Hansen, MD, Chawnshang Chang, PhD, Gerald W. Chodak, MD, and Daniel B. Rukstalis, MD

The Role of Cathepsin Proteases in Prostate Cancer Progression 748
Robert E. Weiss, MD, Carlos Cordon-Cardo, MD, PhD, Warren D. Heston, PhD, and William R. Fair, MD

Altered Extracellular Matrices From Oncogene-Transfected Cells Affect Transcriptional, Mitogenic, and Behavioral Processes of Human Urothelium 750
Jeffrey N. Gordon, MD, Richard N. Schlussel, MD, Wei-Ping Shu, MS, Michael J. Droller, MD, FACS, and Brian C.-S. Liu, PhD

Oncogenic Human Papilloma Virus Type 16 Is Associated With Squamous Cell Carcinomas of the Male and Female Urethra: A Preliminary Report 753
John S. Wiener, MD, Edison T. Liu, MD, and Philip J. Walther, MD, PhD, FACS

Preclinical Assessment of Human Tumor Cell Depletion From Peripheral Blood Lost During Cancer Surgery.....756
Kevin R. Loughlin, MD, FACS, Hong Li, MD, Glenn Richmond, BS, Alecia O'Leary, BA, Daniel Fitzgerald, BA, Timothy J. Eberlein, MD, FACS, and Deric D. Schoof, PhD

Immunotherapy and Radiation Therapy Combined for the Treatment of Murine Renal Carcinoma.....758
Amit Chakrabarty, MD, Gilda G. Hillman, PhD, Richard L. Maughan, PhD, Eric J. Dybal, MD, Daniel W. Visscher, MD, J. Edson Pontes, MD, and Gabriel P. Haas, MD